

PROMOTION RECOMMENDATION  
The University of Michigan-Dearborn  
College of Engineering and Computer Science

Mathumai Kanapathipillai, assistant professor of mechanical engineering, Department of Mechanical Engineering, College of Engineering and Computer Science, is recommended for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering and Computer Science.

Academic Degrees:

Ph.D.	2008	Chemical and Biological Engineering, Iowa State University, Ames, IA
M.S.	2005	Chemical and Materials Engineering, Arizona State University, Tempe, AZ
B. S.	2001	Chemical Engineering, University of Peradeniya, Peradeniya, Sri Lanka

Professional Record:

2014 – present	Assistant Professor of Mechanical Engineering, University of Michigan-Dearborn
2012 – 2014	Research Scientist, Wyss Institute at Harvard, Boston, MA
2010 – 2012	Post-doctoral Fellow, Wyss Institute at Harvard, Boston, MA
2008 – 2010	Post-doctoral Fellow, Boston Children’s Hospital, Boston, MA

Summary of Evaluation:

Teaching: Professor Kanapathipillai is a key faculty member in the bioengineering area, while also contributing to instruction of mechanical engineering courses. She has been very successful in teaching, course development, and instructional innovation. Since 2014, Professor Kanapathipillai has taught five different lecture and laboratory courses at undergraduate and graduate levels. She has developed and taught one new course: BENG426/526 (Fundamentals of Drug Delivery). She has made substantial contributions into development of the recently introduced core courses of the Bioengineering program, in particular BENG325 (Thermofluids for Bioengineering), BENG425 (Biotransport), and BENG381 (Bioprocessing). Professor Kanapathipillai’s teaching is passionate, engaging, and challenging. Students in their comments compliment clarity, excellent knowledge of the modern aspects of the subject, readiness to help students, and willingness and ability to incorporate modern research into class material. Her record is especially impressive in the area of guiding research, design, and independent study projects by undergraduate students. She has the unique ability of engaging students and guiding their efforts to remarkable results. All four capstone design projects supervised by Professor Kanapathipillai between 2014 and winter 2019 were among the best in college competitions. Out of nine guided studies, several brought noticeable scientific results, one of them leading to an invited review paper in a respectable scientific journal.

Research: Professor Kanapathipillai’s research work is in the general area of bioengineering with focus on application of nanotechnology and programmable materials to medical problems, in particular to diagnosing and treating brain diseases. The specific research topics are in such

areas as targeting p53 aggregation in cancer, thrombolytic therapy of strokes, and protein aggregation in Alzheimer's disease. During her work at the University of Michigan-Dearborn, Professor Kanapathipillai has received research funding totaling \$489,500. Of this amount, \$429,500 was received as a principal investigator and \$60,000 as a co-principal investigator. The most significant funding was from the American Heart Association and the NSF-MRI program. During her academic career, she has published 22 articles in peer-reviewed archived journals, 12 of them during her work at the University of Michigan-Dearborn. The high level of publications was unanimously praised by the external reviewers. Combined with the impressive citations data (over 1,300 citations so far according to Google Scholar), this characterizes Professor Kanapathipillai as one of the most promising researchers in the college.

#### Recent and Significant Publications:

- Dhayapulay, A., Kanapathipillai, M. (2019). Exosome based geldanamycin delivery to cancer cells with increased therapeutic efficacy. *Journal of biomedical nanotechnology*.
- Kanapathipillai, M. (2018). Treating p53 mutant aggregation-associated cancer. *Cancers (Basel)* 10 (6). (Invited review). Impact Factor: 6.16.
- Khan, S.,\* Chen, Z., Nadimidla, K., Kanapathipillai, M. (2017). Inhibition of glioma cell proliferation using hyaluronan targeting nanoparticles. *Journal of biomedical nanotechnology*. 13:815-821. Impact Factor: 5.07.
- Papa, A.,\* Korin, N.,\* Kanapathipillai, M.,\* Mammoto, A., Mammoto, T., Uzun, O., Johnson, C., Bhatta, D., Cuneo, G., Ingber, D. (2107). Ultrasound-sensitive nanoparticle aggregates for targeted drug delivery. *Biomaterials*. 139:187-194. \*equal contributions. Impact Factor: 8.8.
- Yeredla, N., Kojima, T., Yang, Y., Takayama, S., Kanapathipillai, M. (2016). Aqueous two-phase system assisted microparticle production, *Scientific Reports*. 6:27736. Impact Factor: 4.12.
- Marosfoi, M.G., Korin, N., Gounis, M.J., Uzun, O., Vedantham, S., Langan, E.T., Papa, A.L., Brooks, O.W., Johnson, C., Puri, A.S., Bhatta, D., Kanapathipillai, M., Bronstein, B.R., Chueh, J.Y., Ingber, D.E., Wakhloo, A.K. (2015). Shear-activated nanoparticle aggregates combined with temporary endovascular bypass to treat large vessel occlusion. *Stroke*. 46: 3507-3513. Impact Factor: 6.03.

Service: Professor Kanapathipillai's record in the service to the university and broader community is comparable to or better than that of other assistant professors at CECS. She has served on several important departmental committees. Her role in supporting major events, such as open houses, new student orientations, and commencements is particularly commendable. Professor Kanapathipillai has also been active in the service to the broader scientific community via chairing presentation sessions at several BMES and AIChE meetings and serving as a reviewer on grant review panels.

#### External Reviewers:

Reviewer A: "From the outset, I wish to state my enthusiastic recommendation (without any reservations) for Dr. Kanapathipillai's promotion with tenure. In my opinion, she has distinguished herself by her scientific endeavors in cutting-edge biomedical fields, which have great clinical relevance and potential for major clinical contributions, her devotion to teaching,

mentoring and advising students, and service to the engineering communities at the local and national levels.”

Reviewer B: “Dr. Kanapathipillai’s teaching and mentoring record is excellent. She is a quality scientist with high-quality publications from post-doctoral work and high-quality publications as an Assistant professor.”

Reviewer C: “If subjected to tenure and promotion process at the University of Alabama, I believe that Dr. Kanapathipillai would be awarded tenure and promoted to associate professor.”

Reviewer D: “She (Dr. Kanapathipillai) is clearly distinguishing her (research) work from that of her prior associations and advisors, while continuing to publish in high-impact journals. ... I am impressed by the breadth and significance of her current research interests. She apparently has very selective and keen eye for emerging research areas.”

Reviewer E: “Given Dr. Kanapathipillai’s publishing record as an independent investigator and her ability to raise not only internal funds, but an external grant from the AHA, she is performing very well relative to early stage researchers in her field at peer institutions.”

Reviewer F: “Based upon my assessment, I can state unequivocally that I am in full support of her promotion to the rank of Associate professor with tenure at the University of Michigan-Dearborn.”

Reviewer G: “I would encourage your institution to promote her to tenure. I believe it would be a loss to your department and students if she were not promoted.”

Summary of Recommendation:

Professor Kanapathipillai has established herself as a successful and innovative scholar in emerging areas of bioengineering. She demonstrates a record of excellence in teaching and service. We are very pleased to recommend, with strong support of the College of Engineering and Computer Science Executive Committee, Mathumai Kanapathipillai for promotion to associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering and Computer Science.



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Anthony W. England, Dean  
College of Engineering and Computer Science



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Domenico Grassi, Chancellor  
University of Michigan-Dearborn

May 2020